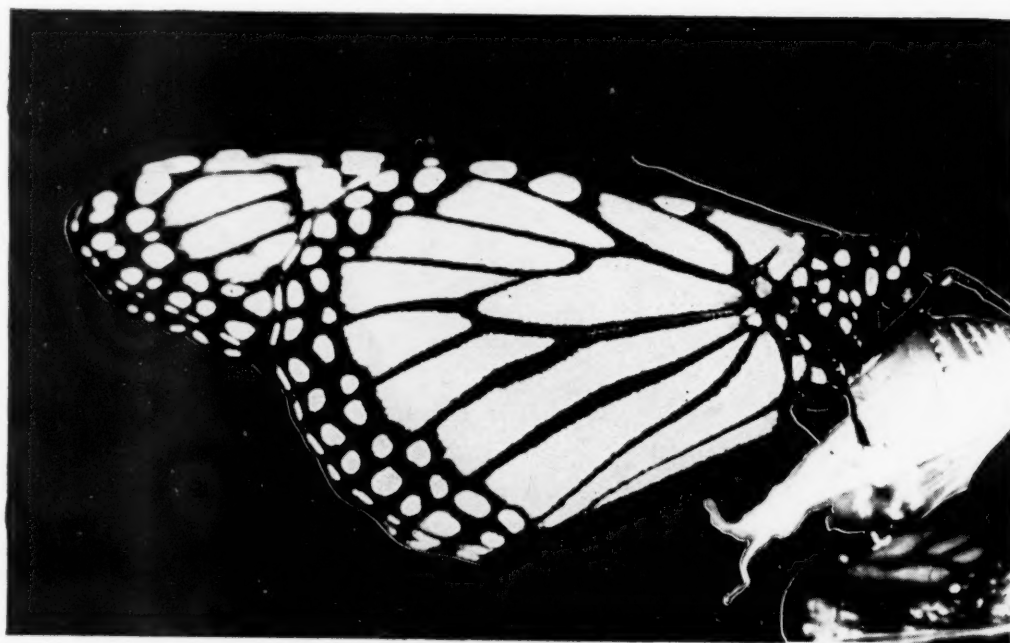


MAIN CURRENTS

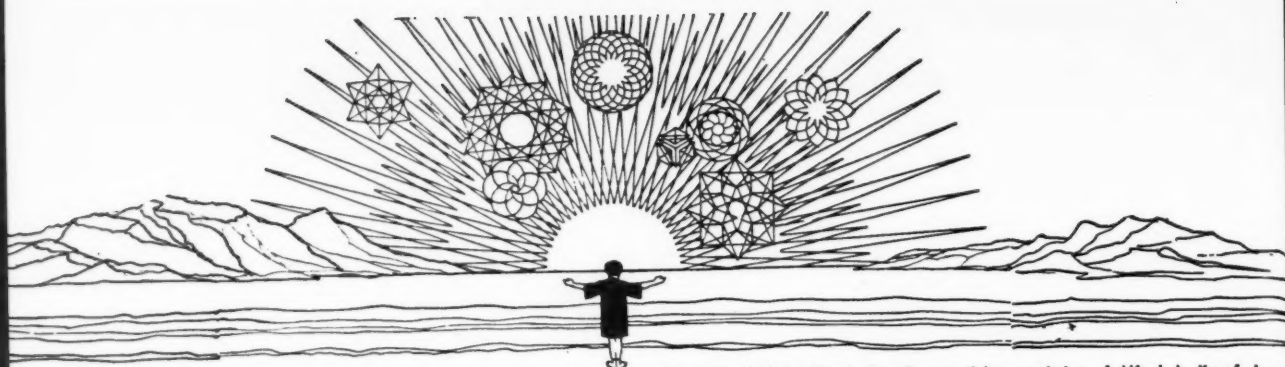
IN MODERN THOUGHT



BOSTON UNIVERSITY
COLLEGE OF LIBERAL ARTS
LIBRARY

MARCH, 1957

VOLUME 13, NO. 4



Copyright 1932 by Claude Bragdon—used by permission of Alfred A. Knopf, Inc.

MAIN CURRENTS

IN MODERN THOUGHT

A cooperative journal to promote the free association of those working toward the integration of all knowledge through the study of the whole of things, Nature, Man, and Society, assuming the universe to be one, dependable, intelligible, harmonious.

CONTENTS

Matter, Mind and Man	Edmund W. Sinnott	75
Man the Incomplete	Romano Guardini	81
A Reappraisal of Education	Harvey W. Culp	86
A Note on the Personal Significance of Abstractions	Mildred Hardeman	89
Source Readings:		
The Effects of Ions on Us		90
Scientific Innovations		91
Double Consciousness		91
News and Notes		92
Reviews		
Matter, Mind and Man, by Edmund W. Sinnott		
Reviewed by F. L. Kunz		93
The Death and Rebirth of Psychology, by Ira Progoff		
Reviewed by Martha Jaeger		93
The Art of Loving, by Erich Fromm		
Reviewed by W. M. Nicholson		95
Frontiers of Knowledge in the Study of Man, Ed. by Lynn White Jr.		
Reviewed by Ruth Lofgren		96

The cover illustration, courtesy of the American Museum of Natural History, is a photograph of a Monarch butterfly emerging after metamorphosis, the process mentioned on page 77 of this issue. Here is an instance of the resources of living organization inexplicable upon any premises save those passed in review by Dean Sinnott in his article, "Matter, Mind and Man."

DIRECTOR: F. L. KUNZ
ASSOCIATE EDITOR: E. B. SELLON
BUSINESS MANAGER: MARGARET WAGNER
PUBLISHER: JULIUS STULMAN

The journal of the Foundation for Integrated Education, 246 East 46th Street, New York 17, N. Y., to whom subscriptions and inquiries should be addressed. Published 5 times a year in Sept., Nov., Jan., March and May. Subscription price, \$3.00 a year, foreign, \$3.50. MAIN CURRENTS IN MODERN THOUGHT is published to call attention to significant contribution to learning currently being made in the multiple fields relating these advances to each other and to classical and contemporary views of Eastern, European and American thinkers. It is designed to save time for the reader by providing a vantage-ground from which whole world of knowledge may be surveyed and kept in proportion as it moves toward integration. Its editors assume that the principles of art, the universals of philosophy, the laws of Nature and Man as formulated by science and the truths of comparative religion, can be orchestrated into a harmonic, meaningful, ethical body of teaching which can and should be made the central core of curriculum study in the educative process at all levels. Contributions to MAIN CURRENTS enjoy full liberty of opinion and expression in these pages. In condensing text, square brackets [] indicate editorial interpolation. Three dots . . . indicate a word, phrase or passage omitted. Copyright 1957 by F. L. Kunz, Port Chester, New York. Entered as second class matter April 13, 1957 at the post office at Port Chester, New York, under the Act of March 3, 1879. (Reentered as second class matter November 12, 1953 at the post office at Port Chester, New York, under the Act of March 3, 1879).

MATTER, MIND AND MAN*

Edmund W. Sinnott

Yale University

The Contribution of Biology Toward a Solution of Mind-Body Relationship

THE problem of materialism can be basically solved by the physicist, who can demonstrate that matter in the old-fashioned sense of being solid and corporeal no longer exists. But the real problem of materialism today is biological: whether living things, including man, are merely material systems, or whether they are something more.

Unhappily, biology cannot contribute as much precise knowledge as can physics to the problem of materialism, because it is infinitely more complex. We always underestimate the possibilities that lie in a little drop of protoplasm; it seems so innocent and homogeneous. Yet it is far from simple. Many people today assume that we have really solved the problems of life because it has been possible to synthesize something that is like a living virus. This, I think, is too optimistic a conclusion. History shows that time after time men have thought they had solved the problem of life, only to have it turn out to be still a mystery.

We must recognize and admit that the contributions biology has made so far to the discussions of materialism are overwhelmingly in support of that ancient and outmoded philosophy. The Theory of Evolution burst with shattering impact on the complacency of mid-19th Century Europe and America. Its far-reaching implications lay not so much in its statement that man had come from monkeys—which was a piece of information to which we were able to adjust our thinking—but in its proposal that evolution was a matter of chance and randomness, and that there was no visible trend or purpose in the universe. George Gaylord Simpson has summed it up thus, "Man was certainly not the goal of evolution, which evidently had no goal; he was not planned, in an operation wholly planless; he is not the ultimate in a single, constant trend toward higher things." This view is now evolutionary orthodoxy.

*Revised, with the author's permission, from a talk given at Wainwright House, Rye, New York, November 10, 1956. The title has been taken from Dean Sinnott's most recent book, which is revised on page 93 of this issue.

To my mind, the challenge which modern biochemistry and physiology offers to accepted notions about life and man is even more serious and far-reaching than evolution. It is not so dramatic in its impact, perhaps, because it is not focused in the work of a particular man or time, but it permeates all our thinking. The idea that man, like all living things, is simply a physico-chemical mechanism has now become orthodox in biology. Joseph Needham has stated the position in this way, "Biologists find their work is possible only if they define life as a dynamic equilibrium in a polyphasic system, consisting of proteins, fats, carbohydrates, steroids, lipoids, and water." The great principle of the uniformity of nature to which we, as scientists, adhere, demands that man be no capricious exception to this principle. Only on the basis of the uniformity of nature can biology progress, and the assumption that life and man are manifestations of this principle has been amply justified by the many discoveries which biologists have made, using it as their basic working hypothesis.

Thus both principle and evidence may be said to support a deterministic and materialistic view. Just how this determinism works is another problem. On one side we have the geneticists, like Darlington, who says in his book, *The Facts of Life*, that determinism is almost entirely in our genes. On the other side, the psychologists may be fairly represented by B. F. Skinner of Harvard, who says in *Science and Human Behavior* that determinism is almost entirely conditioning from the outside. These two distinguished scientists are thus perfectly in agreement on the fact that we are determined, but entirely in disagreement on the mechanism of this determination. These two books well represent the present situation in biology.

I need not stress the point that materialistic theory is unsatisfactory in many ways to many people. It seems to offer no place for freedom and values, personality and the life of the spirit. How do such things fit into a strictly deterministic, mechanistic universe? It may be said that science makes no sense unless we assume the uniformity of nature, but it may also be said that life makes no sense unless it can be

seen in a broader context which includes human purpose and values.

We are here on the horns of an ancient and serious dilemma, and no amount of sophistry or pious platitudes will resolve it. The chief task of the philosopher, it seems to me, is to do what he can to reconcile these two very different points of view. Today men are divided not so much on economic, social and political issues as on the basic philosophical question of what man really is. Ideological differences are really based on much more fundamental problems, and the kind of social order we evolve will depend in no small measure on what sort of creatures we think we are.

AS I see it, the essential argument concerns the nature of matter, on the one hand, and the intangible human qualities of mind, soul and spirit, on the other. What are the relations between the two?

The old philosophy of dualism maintains that body and mind are distinctly different. Yet we find this view fundamentally unsatisfying. It seems to us that if this universe is really what it seems to be, there must be a unity in it, not two separate, contradictory elements. As men, and as part of this universe, we yearn to reconcile these two into some kind of monism.

The commonest form of monism, however, reaches its goal merely by a process of elimination; it wipes out the immaterial part of nature and says that nothing really exists but matter or energy. Mind is degraded into a sort of epiphenomenon, like the picture on a television screen which is entirely dependent upon the mechanism inside it. T. H. Huxley, you may remember, likened consciousness to the whistle of a locomotive, important, but without any influence on the machinery. In such a view, thought may be conceived as a secretion of the mind, much as bile is secreted by the liver. Sir Charles Sherrington, the physiologist, in his interesting book, *Man and His Nature*, tries agonizingly to reconcile the body-mind dichotomy, but frankly concludes, "Thoughts and feelings are not amenable to the matter concept. They lie outside it. Mind goes, therefore, in our spatial world more ghostly than a ghost, invisible, intangible; it is a thing not even of outline; it is not a thing but remains without sensual confirmation."

This kind of situation of course poses an extraordinarily difficult problem. Years ago Professor Tyn-dall, in discussing atoms and their motions, said, "My insight is not baffled by these physical processes; what baffles and bewilders me is the notion that, from these physical tremors, things so utterly incongruous with them as sensation, thought and emotion can be derived." That is still our difficulty. How can mind and its accompanying values maintain the relation to matter which they undoubtedly have, and at the same time possess their own existence and significance?

The problem obviously goes deeper than man, and involves the nature of life itself. In biology we have

the same theoretical dichotomy in the antithesis between vitalism and mechanism. On the one hand there is the idea of a vital force, an *elan vital* which is peculiar to life and not to be measured quantitatively; on the other hand there is the orthodox scientific theory of mechanism. Few biologists today are vitalists. Driesch really fathered this viewpoint, more than fifty years ago, when he postulated an *entelechy*, a sort of "gnome" in the organism which, using very little energy, throws a switch here and there, so to speak, and thus prevents for a moment the operation of some physical law. This idea scarcely furnishes grounds for a satisfactory philosophical position. The decisive battle over materialism in biology will be fought between mechanism and some better alternative.

What can biology add to what it has already said about this problem? I think there is much yet to be learned. We are always in danger of believing that we have already made the major discoveries in biology. When my father went to Harvard in the early eighties, he was discouraged in his aim to be a biologist by his friends, who told him that there was little to be learned in biology, because Darwin had solved all the important problems. We are still inclined to this attitude, but I am convinced that there are many basic problems yet unsolved.

DESPITE the general support given to materialism by biology, various attempts have been made to bridge the wide gap between the mechanistic, deterministic aspects of man and what may be called his mental or spiritual nature. Metaphysicians have pointed out the difficulty of deriving the phenomena of life at all levels from material particles. They have challenged many of our fundamental concepts on the nature and direction of time, and other problems. Indeterminism has been discovered in the lifeless world, and its extrapolation into human freedom has been suggested by some scientists.

For example, in *Science and Christian Belief*, Professor Coulson of Oxford argues that science is one view of reality and religion another view of the same reality, both valid. Others, like duNouy, say frankly that there must be some supernatural factor in life, as yet undiscovered. His view is that "There is no hypothesis capable of explaining the birth of life, the development of consciousness, without the intervention of factors that can be described as extrascientific or supernatural." He suggests that there are two categories in the universe, the material and the spiritual; the latter "brings only minute quantities of energy into play, but can orient indeterminism in a definite direction." This is essentially the point of view of Driesch, Ralph Lillie, and others. Parapsychology may be able to offer something which will help solve this problem, for it has accumulated a great deal of evidence which we would all accept if some mechanism could be found to explain it.

None of these attempts at a non-materialistic theory has yet been very convincing to biologists. Each

has satisfied those who would like to believe in it on other grounds, but there is no widely accepted third position between vitalism and mechanism. However, I should like to suggest that there is another position, one which we can find by giving the familiar facts of biology a somewhat different emphasis and interpretation. This may offer a better concept of the relation between life and matter, and also a more acceptable alternative to vitalism and mechanism. It is not, of course, original with me.

THIS view stresses the essential biological fact of organization. The word "organism" is a happy one, because it means that a living thing is an organized system, which some factor has integrated and coordinated.

As J. S. Haldane once said, "The living structure is organized. Every part of it bears a definite relation to every other part. Since the conception of organism is a higher and more concrete conception than that of matter and energy, science must ultimately aim at gradually interpreting the physical world of matter and energy in terms of the biological concept of organism." This is a challenging statement. In other words, given this concept of the organism, life may be said to interpret matter and energy in terms which physics and chemistry would never have reached by themselves. Instead of depending upon a greater knowledge of the physical sciences to construe life, we may look forward to the day when physicists and chemists will have learned to interpret some aspects of the lifeless universe in biological categories.

The organism is a self-regulating, integrated system. This fact is so familiar that we often fail to remember how remarkable it really is. When food is taken into the living body of a plant or animal, random atoms and molecules are at once built very precisely into a system in which each takes its particular place until it is replaced by another. The parts are held together as an organized unity, under control, until at death this control is relaxed and disorganization at once ensues.

This organizing process can be easily observed in normal development. Anyone who watches the unfolding of a flower from the very start witnesses a process that seems almost miraculous. When the process is speeded up, as in the development of an amphibian embryo, the observer receives a vivid impression that here is the working out of a plan by some unseen craftsman, so to speak. There are those who have tried to explain the fascinating processes of embryology as merely a parcelling out of "determiners." This explanation is unsatisfactory, however. If we block the embryonic process experimentally, we obtain some remarkable results, for the organism tends steadily and persistently to come back to its norm, to restore a single whole.

Regeneration is this remarkable process of remaking. As you know, if living skin is cut it heals over completely; something tends to restore the lost parts.

There are varied and interesting examples of this sort of thing. One that we have been working with in our laboratory lately is perhaps so simple as to appear almost naive. We may take a young pine tree, eight or ten feet high, and tie its branches in various ways. The pine tree has a definite form or pattern which distinguishes it, and enables us to recognize it at once against the sky. Its branches lie at an angle of about 70°. If, in the fall, we can tie some of its branches down and others up, the next spring we can observe the direction of growth of the shoots coming out of the ends of the branches that were tied into abnormal positions. These always have a direction of 70°. This is related to the fact that "reaction wood," which grows a little faster than the rest, pushes a branch up or down. This in turn depends on the growth hormone, auxin. But the question is, how does just the right amount of auxin get to just the right place at just the right time to make just the right amount of bending? There is a pattern in this little pine tree, and the tree "tries" to restore that pattern if it is disturbed.

Similarly, if one separates the first two blastomeres of a frog's egg, each of them, instead of making half a frog, makes a whole frog. The egg reorganizes its structure, just as the pine tree reorganizes its disturbed pattern. The same thing occurs in homeostasis, the physiological regulation of functions which keeps our body temperature constant. This *vis medicatrix naturae*, this "wisdom of the body," as Professor Cannon calls it, perhaps cures more of us than the skill of all the doctors. There is something that tends, in every organism, toward restoring the normal, living, organized system, if it is disrupted.

It can be proved in many plants (in animals with more difficulty), that almost every cell is capable of restoring the entire organism. If we place an African Violet leaf on damp sand, a single cell of the epidermis may produce a new plant. This need not surprise us, since we know that the whole set of chromosomes and, presumably, all the genes of the plant are present in every cell. There is that in each individual cell which represents the entire plant or animal.

So long as the cell is part of a system, it subordinates itself to the whole, but if that cell, or a group of cells, is removed from the system, it at once begins to reorganize its material into an organism.

ONE of the most dramatic examples of such reorganization occurs in one of the sponges. If we break up this organism into its individual cells, these will come together again and re-form the original shape. Something in every cell seems to say "sponge." Equally amazing is the case of the caterpillar when it pupates. All of the inner parts of this organism break down into a mass of "mush," and out of that disorganization an entirely different organism is molded: a butterfly. The same atoms and molecules are present, but something has changed their structure completely. Certain hormones and enzymes are involved,

we know, but how have they managed to reorganize the same material on an entirely different plan?

Perhaps every cell is "totipotent" — able to form the *entire organism*, but keeping its lowly part in the system so long as it is a working member of that system. There are limitations to this process, and it is displayed chiefly in embryonic stages and the lower organisms. Nevertheless, theoretically at least, I believe that if we could get the right conditions (a big "if"), there is little doubt that every cell would be able to reproduce the entire organism. The fertilized egg does exactly that. Driesch has made a pregnant observation in this connection. "The fate of a cell," he said, "is a function of its position."

It is remarkable that the same biological end may be obtained by very different means. If we cut off a vascular bundle in a plant stem, the plant will reform a new bundle around this cut by the conversion of cells which would normally have a very different fate. If a snail's eye is cut off, it will regenerate a new optical disc, not out of ectoderm, as originally, but out of mesoderm. There are almost infinite examples of what Driesch called "equifinality": the attainment of the same end by very different means, as though the end, rather than the means to the end, were the important thing—the goal, if I may say so. The fact of organic regulation suggests that in every cell there is some norm or end to which it is regulated. What this may be constitutes the basic problem of biology. We must picture a pattern of processes and particles in protoplasm under the control of something about which we as yet know very little. There is no satisfactory explanation of such phenomena, and little real advance has been made in this field since Driesch first brought them vividly to our minds half a century ago. We may say that today we have stated the problem more clearly, but that is about all.

Some people have suggested that bioelectrical fields may be involved in this biological organization. Norbert Wiener and others believe that complex electronic calculators, with their feedback mechanisms, may give us a clue as to how this all works. Even Information Theory has been called upon to throw light on the process. LeChatelier's principle, which states that any system under stress tends to restore itself, may be involved. As Professor Margenau has often pointed out, the Principle of Pauli may be the very beginning of organization.

All of this may be thought of in purely mechanical terms, of course. In any automatic machine, properly set, the product of that machine is present, and we may also say that the organism is present in the pattern of living stuff in each cell. Whatever the explanation, the central fact of organization cannot be denied.

HOW is this biological discussion concerned with the problems of materialism and the relation between matter and mind in man?

The suggestion has been made a number of times

that biological regulation toward structural and functional ends is essentially the same phenomenon as the working out of a purpose in the mind. This statement may seem rather speculative, but there is sound basis for it. Here, I think, is the source of man's psychical nature, where life and the mind come together. E. S. Russell, the British biologist, has put it thus: "Organic activities show characteristics which are also shown in the instinctive and intelligent behavior of ourselves and other animals. Purposive activity, as seen in its highly-developed form in the intelligent behavior of man, is a specialized and elaborated kind of directive activity. Morphogenetic activities and instinctive activities are linked, complementary and functionally equivalent, and resemble each other in their essential character." And Ralph Lillie says, "Conscious purpose, as it exists in ourselves, is to be regarded as a highly evolved derivative of a more widely diffused natural condition or property, which we may call directiveness."

Of course, physiological activity merges into behavior and instinct. Bergson asks where we can draw the line between the factors that develop the embryo of the bird inside the egg and the behavior of that bird when it begins to peck its way through the shell or, later, when it begins to build its nest. These are all parts of the same creative, regulatory activity of life itself.

IN all this, what I have called the goal, or the end, is the important thing. W. E. Agar, the Australian biologist, puts it thus: "The chief objective indication of purposiveness in the behavior of living things is the familiar fact that the sequence of acts by which the goal is attained is by no means always the same. It may be reached by very different routes. Even in the most rigidly instinctive behavior, the animal must always fit the details of its actions to the special situation. The completed nest, the spider's web, the act of mating—each is attained by a train of action different in detail on every occasion. All these facts suggest that it is the *goal*, rather than a fixed series of successive steps, that dominates development and behavior."

Let us not confuse the issue here by saying that consciousness must be involved. Whatever consciousness may turn out to be, conscious purpose is, to my way of thinking, simply the inner awareness and experience of this goal-seeking activity, which goes on within the living stuff of the brain.

From basic biological purpose, some philosophers suggest, all other kinds of mental activity arise. Purpose is at the bottom of them all, and the wish may really be said to be father to the thought. Mind is more than mere behavior; whether due to internal genetic factors or to outer environmental pressures, the same sort of self-regulation to ends is displayed that we see in embryology and physiology. Mind is what guides behavior to ends set up in living systems.

Many objections to this point of view can be and

often have been raised. It seems to put mind, or the rudiments of mind, into all life, even into plants. Yet I think doing so is defensible if we do not confuse "mind" with "consciousness."

There may even be the same sort of organization in *all* matter. I would agree with Professor Mergau's statement that pan-psychism, or the view that the whole universe is informed by a psychic quality, is a perfectly defensible position. Whitehead, as you will remember, said that physics is the science of minute organisms and that biology is the science of larger ones. An atom is an organized system; so is a crystal. However, the difference between these and a living system is still wide. The crystal is static, whereas the living organism is an open system through which material is continually flowing.

As a second objection, it may be pointed out that man's own mental life, his stream of consciousness and thought, is far richer than any single-track purposiveness of embryology. But it should be remembered that what determines goals and purposes in any organism is in no small measure the environment. The shape of a leaf in humid atmosphere may be very different from that in dry atmosphere; the plant is the same, but the particular goal that has to be reached is quite different. In the mind, not only the outer environment but also the rich inner environments of the brain greatly enrich our purposes. Also, purposes may not lead simply to overt bodily acts, but may remain in the mind as desires, as unrealized goals, and as mental acts, ideas, or even abstract thought. All of these, I think, are basically derived from the search for the same kinds of biological goals as those of an embryo, even though on a far higher level.

Third, it may be objected that this puts purposiveness at the foundation of biology where it is supposed to have no place. But if an organism moves toward an end, it *has* a purpose of a sort. It is a teleological system. This does not mean, in the least, that a living thing has a natural ability to choose what is proper for its survival. Those organisms whose goals have been unfavorable have simply disappeared. The short-legged Ancon sheep was a mutation which was formerly useful because it could not jump over stone walls; it would not survive in nature. There is a false and a true teleology which our students should be taught to distinguish.

All this is unorthodox psychologically, because modern psychology tends to make *drives*, such as sex, hunger and ambition, and not goals the basis of motivation. But in an action, something more than a drive, than a stimulus and response, is involved. The particular response that is made to a particular stimulus is not an invariable and inevitable thing; it is determined in no small measure by the particular goals set up in the brain. The response is regulated by these goals. The basis of motivation, I would say, is therefore not the drive from behind but the pull from ahead; it is the carrot rather than the stick that moves the donkey.

I believe that in all this a good case can be made for the idea that mind, which we think of as immaterial, and body, which we think of as material, have their roots in a basic phenomenon of life: organization, self-regulation to ends. One expresses itself in structure, in the actual configuration of matter in the body. The other expresses itself in the motions of that matter. But both are under the control of protoplasmic activities, whether ending up in structure or in behavior, and there is no sharp line between them.

Just what life and mind actually are will have to wait until we finally discover what biological self-regulation is. The great advantage of the concept here presented is that it brings these two spheres of mind and matter together into one, thus satisfying our desire for a monistic philosophy. If it is a true concept, the problem may be attacked not only by the philosopher, the metaphysician, the physicist and the psychologist, but also by the biologist in his laboratory. The biologist studies *morphogenesis*, the science of the origin of form. Form is the basic problem, because form is the visible expression of organization.

Since protoplasm is a material system, must not matter and energy still be closely involved with life? Of course they must. All life may turn out to be as mechanistic as an automatic machine. But we should remember the possibilities that may lie in matter as it is acted upon by the forces in the universe. J. C. Smuts, in his interesting book, *Holism*, says this: "If we believe that life and mind are evolved from matter, if matter holds the promise, the dread potencies of life and mind, it can for us no longer be the old matter of the materialists. Matter discloses a great secret: in the act of giving birth to life and mind it shows itself in an entirely unsuspected character, and it can never be the old matter again." And Paul Sabine, the physicist, says, "Unless we assume some miraculous transformation to occur in matter when food is assimilated and becomes the living tissue of an organism, we are compelled to ascribe to the ultimate stuff of the material world potentialities that are beyond the physical and chemical properties of inert matter."

AS has often been suggested, in this problem we are forced to assume the operation of laws and principles as yet undiscovered. Schrödinger and Heisenberg, both physicists, have come to this conclusion about life processes. Recently Max Delbrück, a biophysicist, said, "Instead of aiming from the molecular physics end at the whole of the phenomena exhibited by the living cell, we now expect to find natural limits to this approach and thereby, implicitly, new virgin territory in which laws may hold which involve new concepts and which are only loosely related to those of physics."

Thus I conclude that the old materialistic dogmatism is beginning to break up in biology. In this sense

we may speak here of "the decline of materialism." There *is* an alternative to mechanism and vitalism: organicism. We do not yet know well the laws of this domain, yet we cannot but believe that there is the same orderliness in biology that we find elsewhere in nature.

Biology has been too conservative in its ideologies. This is natural for it has had to defend its position as a "real" science, in the modern sense. It should follow the example of physics, however, and adventurously explore every road, however unfamiliar its direction, that may open up new territory.

THE problem of life will not be solved, I think, by the discovery of specific substances, like the nucleic acids, or the hormones. It is not in these that we must seek the secret of life, but rather in the patterns and configurations of matter, resulting perhaps originally from something like the Principle of Pauli: steady states, open systems, dynamic equilibria. In other words, it is not matter primarily which must concern us but, as Aristotle and Plato suggested so many years ago, the living form. That is why morphogenesis and morphology are the basic disciplines in biology.

The interpretation of life that I would thus suggest offers the advantage that not only can it focus the attack on the problem of the life and mind of man at one point, but also that it finds room for many things which materialistic mechanism excludes.

One of these factors is intention. The most vivid and interesting part of a man is concerned with where he is going, what he wants to do. Motivation is involved here. Motives do not come from behind but from the pull of something ahead of us that makes us do a thing because we *want* to do it. Perhaps in

education we should pay more attention to stimulating the ideals and desires and tastes of our students, rather than to giving them more factual knowledge.

The "self," which is coming back into favor in psychology, is merely the recognition of the integration of living stuff into an organism. There is a good biological basis for the self and even, if you will, for the "soul." A basis here is also provided for values—truth, beauty, right. Values are what we want, what life tends to move toward.

The question of freedom may also have some new light shed upon it. If what we are is a series of purposes, then the purpose and the purposer are one, and to deny man freedom is meaningless.

Ethics may provide an expression of this same sort of thinking. The goals in a body which lead to health are good goals. The goals in a social body which lead to its health are ethical goals.

Even the human spirit may be looked upon as an expression of the highest goals of life. Life, it seems to me, is not determined by inner activity or outer factors alone. It has a specific character and quality of its own which guides it. It is creative, or as Ralph Lillie says, it is the "anti-conservative" element in nature. Perhaps life may share in whatever brings order into the universe. Perhaps it aspires to lift its goals towards a closer communion with that profound orderliness, that principle of organization, which we may even regard as one of the attributes of God.

Biology should cooperate with the other sciences far more than it has in the past. We certainly cannot disprove materialism as a philosophy, or establish the truth of religion through biology alone, but I think we may use it fruitfully to provide a scientifically defensible and intellectually respectable foundation on which a satisfying religious philosophy can be erected.



MAN THE INCOMPLETE *

Romano Guardini

Munich University

The Dangers of Dependence upon External Techniques to Solve Society's Present Dilemma

THE problem of man today, civilized man, equipped with the extensive knowledge and the powerful resources of modern life, can only be fully understood against a background of the primitive life in which he had his beginnings.

Primitive man was opposed by a nature which was incomprehensible in its forces. He faced its hardships and threats with very inadequate physical powers, but he possessed within himself a unique faculty which enabled him to overcome the dangers of his environment: the human spirit. This spirit was destined to create a culture in a very short time, judged in terms of biological evolution. At first, however, it increased the hazards of man's existence rather than supported it, for it subjected him to difficulties unknown to the beasts which were his foes: grief, fear, privation and terrible anxieties which, as he confronted the incomprehensible forces of nature, took on a daemonic horror in his profound but intuitive religious experience. Many of the anxieties which today remain embedded in man's unconscious had their origins in this dark period.

But man showed fight, and he began to fashion weapons to assist him in his struggles. Experience was the first of these, helped by "instinct," that is, the involuntary intuition or empathy for his environment. And then he began to invent tools, at first simple ones which were extensions of his bodily functions. But later he learned to control both nature and energy, and to guide them so that specific results followed. Thus he made what we call the machine—that objective, self-sufficient entity by which natural forces can be made to perform special tasks. Thus, from the advancement of his experience, from the safety provided by his instincts, and from skill in choosing and arranging available raw materials, man developed the tools by means of which he took possession of nature.

*Revised from the report of a lecture given before the 1955 annual meeting of the German Iron and Steel Engineers Association, published in *Stahl und Eisen*, and translated by Gilbert E. Doan.

Conscious rationalization contributed, for man not only happened to retain accidental experience in his memory, but also understood the processes involved: he found rules for their sequence. All this gradually led in historical times to an exact knowledge of nature and of her laws.

Thus man became ever more decisively master over nature. But we must note that in this process a principle was operating which the physicists call reaction. When I pick up a stone, its weight requires me to do work. When I own something, I must guard and protect it; the simple fact of ownership changes my attitude. That is to say, man cannot exert an influence without himself experiencing a reaction. Every time he grasps something, he himself is gripped. From all of this there results a highly complicated structure of responses: the necessities of life find satisfaction; the psychic nature of man is revealed; the value of existence rises. That extraordinarily complex and ingenious organism gradually develops in which personalities and objects are woven together into what we call "civilization."

Man has at last overcome that shocking and humiliating kind of life described above: the clash with nature and the fear of natural forces. The greater the power over nature, the freer the life, the richer the existence.

II

IS this the complete equation of man and nature? The modern attitude says it is, expressed as follows: The course of history reveals a steadily improved control over our physical environment, which raises our standard of living, and increases our safety, the degree of individual development, and opportunity for personal happiness.

This may be true to the extent that the individual is able to use the worldly goods he has acquired, so that the complementary effect of his acquisitions reacts directly to his own welfare of body and mind. But history shows us that situations arise again and again in which the man no longer uses the possessions he has acquired, and so can no longer guide the cap-

tive energy. Then he ceases to recognize a scale of values or to exercise a clear sense of direction by which to control his constructive and destructive tendencies. The pressure of the immediate material, political and social situation then becomes stronger than his ability to remain free.

Man does indeed become safer, less dependent, more creative, as a result of his growing power over nature, but only so long as he can answer correctly the decisive question: power, for what? For power takes its character from the uses to which it is put, and it is self-evident that man does not always use power justly.

What are to be our guides in solving the problem of power? First, of course, there are the moral imperatives of religion, but these are effective only inasmuch as they are accepted and used by the individual. Education, then, is very important, and the disciples of progress today place an almost religious faith in various educational efforts, being convinced that in education lies the fundamental solution. Basically, however, this belief is questionable, for man lives by his own decisions, and these are uncontrolled. History begins anew with each individual, and education has so far only taught man how to implement his decisions more effectively.

If we go to the heart of the matter and ask what it is that guides man in his decisions, we are forced to the answer: his sentiments and convictions. And if we press still deeper and inquire what forms and influences these sentiments, we can only find the answer by looking within ourselves. The testimony of history, with its long chronicle of unscrupulous self-interest, growing in intensity and power during the last half-century, is a serious indictment of what it means to be a man. In the light of this, there is little comfort to be found in the ever-growing power of man over nature and over his fellows.

This expansion of power is increasing so rapidly and on so many fronts that one almost gets the feeling that man can do anything. If this sounds too insolent, we can limit it to the statement that if man researches long enough, experiments exactly enough, reviews experience upon experience, he can do everything he wants to do. And there is so little intoxication and phantasy in this attitude, so much that is sane and sober, that it takes on character.

III

WITH this we are close to the danger that superpower brings us.

It lies first of all in the fact that the power which puts man in a superior position as regards nature is the same that he can turn upon other men, other social groups and other nations in order to subjugate and destroy them. And who decides whether or not such a step is taken? Man himself—the man who is in command at the moment. Thus the fate of society is dependent upon the extent to which this man in power recognizes the compulsion of moral standards

with respect to the uses of his power and the goals to be achieved thereby, and also the degree of his strength to carry them into effect in a given situation, against the numbing pressures of political, economic and emotional interests.

Still another question must be faced: Does the misuse of power threaten only those against whom it is used?

Long ago Socrates would have said: "My friend, you forget the one who is injured most deeply when abuse is done, namely, the one who practices the abuse." Power is constructive as long as its possessor remains sensitive to moral imperatives and conscious of the equilibrium of existence in which every impulse at one place causes corresponding changes elsewhere. If this attitude of moral responsibility does not persist, however, the power man has won by such prolonged endeavor turns against his very existence.

IV

MODERN man has today developed to the utmost those talents which are necessary to promote science and technology. As a result, there is an endless abundance of goods and services available, and an amazing power over the means of existence. The question is, has man also the humane concepts which are essential to control all this, so that a real culture or civilization results, an organization in which the individual can live in freedom and honor? In other words, does he possess all the attributes which he needs to achieve a complete and full life?

As I see it, modern man, who has accomplished so much in the last five hundred years, has undergone a transformation. Certain of his capacities, those which he values and uses most, have become stronger, sharper and more exact. But others, less used, are weaker, duller, more feeble, and still other capacities and attitudes which are essential to the complete man have been wellnigh lost entirely. Man has become incomplete.

Let us examine this statement.

V

MAN is a talking creature. He has the gift of speech by which he can communicate what he knows to other men and so achieve true communion of ideas with them. This expression is complete if it communicates actual observation, knowledge and experience. But it is only possible if in the same person there is the capacity for silence. This is not something negative — absence of speaking — but something in the highest degree positive—an inner stillness, a released vitality and depth into which experience can be accepted. In other times man has been much more appreciative of the peaceful abundance which can develop from the silence between two friends. We need only look about us to observe the extent to which silence has disappeared and confusion taken its place. Now hardly anyone listens to anyone else, the desire to hear our own voices is so compulsive. This confu-

sion grows both externally and internally, for the inner state, even of those who say nothing, is often far from still. Words become thinner and cheaper, losing in sincerity, in depth, and in value.

Man is active; he surges forward, competes, overcomes, works, fashions. He masters the world of gadgets, becomes architect, executive and law-giver of the world. But to complete his life, he needs the ability to rest. And real rest is again not negative, not just a cessation of activity which is often compulsive or induced. It is rather the opposite pole of performance, just as silence is the opposite pole of speech. Rest is another expression of life, a withdrawal following which action is freshened, becomes sure-footed, novel and creative. Yet repose is disappearing more and more from our lives today.

Action has its own important place in human life. In it, a man experiences the external world, defends himself, penetrates and conquers. But this same man is able also to withdraw into himself, to be master of his inner world. Into this sanctuary a man carries what he has acquired in his contacts with the external world. Here he passes judgment on it and adapts it to himself. From this results what we call the universe of a personality.

This capacity for withdrawal, the ability to be alone with ourselves, is steadily diminishing. Man is more and more "outside," exposing and revealing himself in gatherings, interviews, newspapers, magazines, radio, television. Privacy is continually invaded, and ever more glaringly, in the picture of our times, appears the trait that one can only describe as the loss of modesty.

It may be asked whether this externalized existence and the consequent evaporation of the inner life is not due to the fact that modern man is bombarded with propaganda, cramped into organizations, and, in spite of his devotion to democracy, regimented by the state and its regulations?

Let me answer the question in this way. Man has the secret ability of perception. He is able to absorb whatever exists, and transform it into a possession, which we call knowledge. Beyond this, he is able to explore and experience his intellectual knowledge until it becomes what we call understanding, in which the essence of the thing becomes clear, and the power of its significance can be experienced by the self. More than thirty years of university work may permit me to make a judgment: Knowledge, intellectual control, is increasing at such an amazing pace that it is becoming almost impossible to handle. The threatening and immediate problems of education which face the universities and the professions have their roots, primarily, in this situation. But the deeper aspects of knowledge, which arise from insight and experience—the comprehension of essentials, the understanding of the whole, the power to create—these grow weaker. This comprehension can only result, I insist, from that inner contemplation which requires silence, rest and recollection, and these are everywhere being dis-

carded. Knowledge grows; truth diminishes. This loss by man cannot be blamed on propaganda and external regimentation.

There is a further result. Man is able to differentiate: between right and wrong, between the valuable and the worthless, the important and the trivial, means and end. He can determine not only what is, but what its value is, and he can take a position with respect to it. He can affirm or deny. But he can do this only if it has become clear to him what right living means, how it is to be secured, and what its purposes are.

This clarity is steadily decreasing, for it requires constant application. The flood of phenomena drowns the ability to differentiate. The throng of stimulations makes it impossible to see what lies behind them. It becomes increasingly more difficult for men today to perceive the scale of values or to distinguish between means and ends, the principal and the incidental, and thus to reach a genuine decision.

Thus, very briefly, has been sketched out the two basic and essential forms of human endeavor: activity and contemplation. To re-emphasize, the first kind of behavior is that in which man goes out in association with the external world. He aims at an objective, takes hold of it and, as a result of the law of reaction, is in turn taken hold of by the objective. In the other kind of behavior, he seeks the center of his existence, establishes his position there, disengages himself from things, and becomes free from their influence.

The former type of behavior has ruled the lives of western man with increasing power for the last five hundred years. The latter is becoming ever more alien to our culture and losing its strength and validity. The result is that man relies increasingly on external techniques of control, while his ability to stand on his own feet, to judge the whole, to take up a positive and individual position, to reduce to order, constantly diminishes. Thus he increasingly delivers himself over to what is going on at the moment.

VI

THIS brings us abreast of the present situation: while the scientific and technical achievements of modern man grow to gigantic proportions, a part of his own being withers away. He is becoming an incomplete person.

For a long time this appeared unimportant. In fact it seemed that the man who embodied the peaks of activity might represent a higher form of development. He generated his own mythology: the Faust or Prometheus. Such a man justifies his own practices in which work is the be-all and end-all, and out of this attitude present-day totalitarianism has erected an entire politico-social system, indeed a form of religion. Yet those of clearer vision have deep misgivings about the ultimate effects on man's psychological and spiritual health.

We may ask ourselves, can man carry on in this tempo? Can he control the forces he has freed? Is he

mature enough for the task, so that his achievements will survive, create a future, and not drive the world to a catastrophe?

These are questions which many are asking fearfully. To my mind their fear is valid, for the growing danger, both for external life and for inner health, is that man is confronted with a situation that he does not know how to control, for the simple reason that he is no longer a complete man.

I need not remark that this statement imposes no judgment on scientific, technical or economic affairs. I am concerned with these only as they form part of the total human situation. Actually, however, even technical problems cannot be solved in isolation from larger issues, for technology is inextricably woven into our social structure. The question is, are man and his fate consciously and constantly present in the minds of those who determine the course of scientific developments? Are they possessed of the inner objectivity and strength which is a match for their amazing technical achievements, which have created a situation in which problems of motives, interests, organizational developments and human relationships are all equally involved?

This discussion does not arise out of an inert pessimism, but rather from a wish to determine the facts of the case in order to set up a problem to be solved.

In the midst of our many accomplishments we have lost sight of that which is needed to support those accomplishments. The situation is simply that man has immersed himself in his activities for such a long time and to such a degree that they have obscured or displaced the other equally important and valuable elements of his life. This has had a sure effect upon the character of the accomplishment itself, as we realize the moment our attention is riveted, not on a single area, but rather on the inter-relationships of all elements—the entirety in which man exists, his culture. In the face of all that man has done, he is today sick.

VII

WHAT, then, is the problem? Simply, that man must learn to control not only the forces of nature but also his own inner forces. Those technical developments which are now governed only by the logic of their own problems and goals must be integrated into human life, if we are to correct a situation in which the processes of invention, automation and production run on, without regard to the results for mankind.

To do this requires deliberation, and a dispassionate clarity of outlook. The ability to discriminate between the essential and the peripheral, between the hopeful and the merely interesting, between the enduring good and the momentary convenience, is something rare and to be won only with diligent attention.

Such guidance can be supplied only by one who is able to resist such stimuli as the earning of money, the will to power, and the lure of novelty. It can be gained through knowledge of the inter-relationships of life, and through an aloofness from personal inter-

est which in the final analysis can best be described by a word which the bourgeoisie of past centuries has badly degraded, "asceticism," or training and self-discipline. Confirmation of this view, as an advance, not as a "return to the past," is given in a thesis, *Technical Progress and Cultural Adaptation*, by W. Berkefeld: "The relationship of scientific discovery, technical application and industrial exploitation has long since become a superstructure, automatic and ethically entirely irresponsible. A sweeping alteration in this situation can only be attempted if one seizes the beginning, where the desire to know starts it off, or the end, when the desire of the consumer rules. In both cases self-discipline, if it appeared at any point, would give the signal for a new epoch." Perhaps the future of mankind really rests on a newly-gained ability to fetter the drive toward power and gain, because this step involves decisions on which greater progress, if not all human existence, is dependent.

This step is possible, however, only if man can recover the ability to be still, to be silent, to collect and possess himself, to disengage from the world, to perceive the meanings within the things and to judge on that basis, rather than to yield to the pressure of objectives.

You will realize that we are dealing here with something quite the opposite of that psycho-technology with which modern "mechanics of the personality" influence the attitude and tone of the worker, in order that his basic productivity may be increased, and his adjustment to his work may be more successful. Such efforts only entangle him deeper in the process. Our purpose is entirely different: to disengage him from his work, in order that by gaining perspective toward his immediate achievement he may be able to see whether his work stands in a right relationship to humanity as a whole.

I have no formulated technique for the solution of this problem. I only know that man must begin to seek and pursue this new objective with the same energy with which he approaches the mastery of a new machine.

To illustrate the urgency of the matter, I should like to point out another aspect of the present situation which I feel is not sufficiently considered.

European culture has already lost the privileged position which it enjoyed over other peoples as a result of technical superiority. The Asiatic peoples, especially, have now entered the arena of world affairs with great force. These are peoples in whom are still strong those components of human nature which have been stunted in the West. This is true not only because these people, like the Africans, still have a strong bond with nature, but also because they have an age-old tradition of self-recollection, of contemplation, of reliance upon inner strength, which is still full of vitality. They have this resource. They are still "complete" men. If these peoples soon equal us in science and technology, which they may well do,

as they are advancing with great skill and at a rapid pace, then the West had better seriously consider its position, or it will be displaced as a world influence.

It is true that in the passion of transformation the Eastern peoples are also in danger of losing much of their inheritance. But such an ancient skill and mode of existence do not vanish so quickly. What is more, these people have the advantage that they can make use of the achievements of the West, and begin where we have left off. They are able to attack the problem of the human self in its relation to modern life with an experience, as well as an insight, that has not been available to us. Thus the probability exists that they will successfully exploit the new developments which we have failed to use to best advantage; things will be obvious to them which we perceive only with effort. From this point on they can win a superiority which we will not be able to equal with our more complicated machines and larger bombs. They will have the intangibles on their side.

VIII

IS it possible for the individual to do something of practical use in this situation? On the personal level, I believe that there is something to be done. To make a concrete suggestion, I would advise all active men, like engineers and technicians, to perform spiritual exercises at least once a year, that is, make a retreat and practice real silence. At such a time, a man can ask himself questions about the character of human nature and the meaning and value of the contemplative life, by which is meant nothing narrowly religious or sectarian, but rather a method of reaching back to the essentials of man's nature, of integrating him, and in this way freeing him from his fragmentary existence.

Perhaps many a man who prides himself on his realism will laugh at such a suggestion. A shrewd Chinese or Indian, however, would not laugh. On the other hand he might wonder that we in the West

have been able to advance so far with such explosive things as science and technology without having been forced to consider the ethical or spiritual presuppositions that are necessary in order that nothing should go amiss.

Or one might suggest that everyone should take care that his Sunday should be a real day of rest and quiet, and not simply an active patronage of the entertainment industry. Still better, one might advise that in addition, each person should attempt to have ten minutes of quiet every day.

It is not easy to make such suggestions. To gentlemen such as yourselves, who deal with realities of great weight and undertakings of vast influence, it may well seem that such suggestions as these can be of little over-all significance in our present world crisis. Yet from my point of view they reach to the heart of the matter which concerns us all: the human problem.

For if we trace back to their foundations all our scientific researches, technical efforts, and concern about political organizations, what do we arrive at? Man, and the basic conditions of his existence. The achievements which fill our days are so great that the superficial observer easily gets the feeling that they are supported by their own mass. It has even been suggested in some quarters that the achievements may in the long run supplant many functions long considered to be uniquely human. Yet actually all of the decisions upon which they are based, even the most realistic, arise from that moment in which the man making the decision was alone with his private insight and his conscience, and asked himself, what is right? Machines may deal with statistical norms, but these are not values. At such a moment of decision a man must act, not as a scientist, not as a technician, not as a promoter or a politician, but as a human being.

It is therefore to the task of making modern man into a *complete* human being that we should direct our energies.



A REAPPRAISAL OF EDUCATION

Harvey W. Culp

Foundation for Integrated Education, and
Board of Education, Ossining, N. Y.

ARE we not, generally, trapped into thinking of education as a *closed system*—just as we have until very recently unanimously considered almost every aspect of human society, from families to international relations, as closed systems? McClelland attacked this problem as it concerns international relations.¹

To this author, McClelland's view of the situation of the broadest social scale very closely parallels the problem of education. Certainly it can be said that we have had more studies of education in recent years than would seem possible. The diversity and lack of common point of view in these recent studies indicates a breakdown in education as an integrated field of human behavior and human relations.

Just as outmoded mechanistic models unfortunately still prevail in our view of many social institutions, so they are very common in ideas and definitions regarding education.

Educators, like everyone else, are faced with an enormous amount of data—data which they must organize for themselves, which they must organize for transmission to their students, which they must assure remain organized in their students. As a result of this very human practical problem, teachers tend to systematize their data.

Education is commonly referred to as a "system." Being made up of teachers, administrators, and teachers of teachers, such a system tends to become a system of systems, in which each teacher's role is thought of as "fitting in" with the roles of all other teachers as parts of a mechanism whose function is "the process of education." In a similar manner, curricula have tended to become formulations of process units. For example, a student entering the tenth year of public school can be defined (in the thinking of an educator) as one who has successfully completed the elementary educational process (i.e.), one who is presumed to possess the elements of education and who has had three years of Junior High School. But, 190

The Significance of Biological Concepts for Education

school days (state aid time units) later, he is definable as one who retains all of the above and who has had in addition Mathematics X, Science Y, Social Studies Z, English X, and Guidance I.

By the time two more years of the educational process have been completed, colleges look at the public high school product as one who has completed a minimum of sixteen units. If successfully admitted for further processing in college, the student begins again to accumulate credit-units, or points. In all of this, education appears as a process or system whereby a product results from accretion of data, summation of facts, or addition of course units. And all along the way, the student is subjected to systematizations of data by teachers who tend to ever-increasing specialization and who present material accordingly. (cf. Teachers College catalogues) which list salary-increment points for teachers on such subjects as "How to Arrange Classroom Bulletin Boards," "Teaching Fourth Grade Subtraction by the Decomposition Method," etc.

What we have just said may be assumed to be criticism of professional educators. But the criticism applies as much, if not more, to the general public, particularly to parents and taxpayers who insist on departmentalization and on specialization. To them, if geography is not taught as geography, for example, it is not being taught at all. What is even worse, parents are tempted to prefer numerical grades so that they may boast of Imogene's 2% superiority in some subject over Suzy.

Educators, parents and taxpayers all seem possessed by the idea that the educational system is something apart from the other "systems" of human living. Boards of Education resent it that the home throws its responsibilities upon the schools, and are irate when called upon to assume responsibility for the transportation of children in an age when transportation has become a major factor in human inter-relationships. Parents resent the invasion of their ancient privacy when the school psychologist focusses upon a home situation as the source of an educational difficulty. Taxpayers become wroth when their taxes soar, partly as a result of legislation which those same taxpayers'

¹McClelland, Charles A., "Applications of General System Theory in International Relations." MAIN CURRENTS, Vol. 12, No. 2.

representatives have passed requiring attendance in school by *everyone*, regardless of adaptability to formal schooling.

Yet there are few aspects of life which are more human or more fundamental than education. It seems obvious that if education is to achieve values for living humans, it must be structured congruently with and be assimilable by these humans. But this cannot be, so long as education is presumed to be a *closed* system within society.

Now this concept of closed versus open systems is relatively new in science, so new that few educators have had opportunity to obtain the perspectives which it affords. In view of the requirements for theory and philosophy of education which are standard for professional licensing, education is a system. Since it deals with humans and is an arm of the State, it is classifiable as a social science, and as such has been influenced by the philosophy and methodology of physical science.

Classical or conventional science deals with systems which are isolated from their environment. In treating such closed systems, physics and chemistry are able to state reaction rates and times, and the products which will result when a number of reagents are put together under given conditions in a closed vessel.

Parallels to this in educational methodology and philosophy are not hard to find. In taking over the principles of classical mechanics, education, like other social sciences, took over the philosophical implications of the second law of thermodynamics. There was a time when it was fashionable to agree with Descartes that "man is an animal, all animals are machines, therefore man is a machine." Somewhat later, this concept developed into the mechanistic philosophy of behaviorism and conditioned reflexology.

But the modern physics of atoms and nuclear particles is neither mechanistic nor materialistic. At the same time, modern biology deals with systems which by their very nature are *not* closed systems. Von Bertalanffy¹ comments on this as follows:

"Every living organism is essentially an open system. It maintains itself in a continuous inflow and outflow, building up and breaking down of components, never being, so long as it is alive, in a state of chemical and thermodynamic equilibrium but maintained in a so-called steady state which is distant from the latter. This is the very essence of that fundamental phenomenon of life which is called metabolism, the chemical processes within living cells. What now? Obviously, the conventional formulations of physics are, in principle, inapplicable to the living organism *qua* open system and steady state, and we may well suspect that many characteristics of living systems which are paradoxical in view of the laws of physics, are precisely a consequence of this fact."

One of the paradoxes which Von Bertalanffy discusses is the contrast between living and non-living

things as regards cause and effect. "In any closed system," he says, "the final state is unequivocally determined by the initial conditions. . . . This is not so in open systems. Here, the same final state may be reached from different initial conditions and in different ways. This is what is called equifinality, and it has significant meaning for the phenomena of biological regulation." Another paradox is the contrast between the inanimate and the animate as regards organization. "According to the second principle of thermodynamics, the general trend of physical events in physical nature is toward states of maximum disorder and levelling down of differences. . . . In contrast, the living world shows . . . a transition to higher order, heterogeneity, and organization. . . . In all irreversible processes, entropy must increase. . . . In open systems, however, we have not only the production of entropy due to irreversible processes, but also import of entropy which may well be negative. . . . Thus, living systems, maintaining themselves in a steady state, can avoid increase of entropy, and may develop towards states of increased order and organization."

In dealing with humans, and especially in teaching them, we are dealing with the paradoxical non-physical behavior of life itself. It is no wonder, then, that under the operation of the laws of equifinality and negentropy, teachers often observe that the (stupid) stone which the (educational system) builders rejected becomes the cornerstone of the (scientific, economic) temple!

The new branch of physics dealing with communications is concerned with *information* which, for several reasons, cannot be expressed in terms of energy but in terms of *decisions*. This, in turn, possesses similarities to negative entropy. Moreover, the concept of feedback, which bulks so large in importance to Communication Theory, has been shown to apply to life in general, to humans, and to human society. This demonstrates the fact that living systems are regulated by dynamic interaction among their parts as *open systems*, operating under the principle of equifinality approaching or maintaining a steady state. Other regulative forces of the feedback type render living systems more efficient in the achievement or maintenance of their goals.

Science must now admit that goals and directiveness do exist in living organisms and certainly in human behavior and human society.

WE have gone into basic theories at this length, because it seems to us that these few concepts of present-day science have not been properly evaluated, much less applied by educators.

Since human life, human behavior, and human social institutions can now be viewed as *open systems*, and since education can actually be defined as a feedback whereby humanity is steered toward its goal of maximizing the development of its "basic resource of creativity," it follows that we must reappraise educa-

¹Von Bertalanffy, L., *MAIN CURRENTS*, Vol. 11, No. 4.

tion in terms of these concepts of modern science.

McClelland¹ concludes that, "Since the matter of regrouping the materials of international classes in the interest of better integration [a modern concept of holistic dynamic interaction] has become an important theoretical concern. . . ." Von Bertalanffy² sees the implications of General Systems Theory for education as providing "important headway towards interdisciplinary synthesis. . . ."

The implications of these concepts for curricular reform are obvious. If education is to perform its function of feeding back into the current living moment the information of cumulative success of the race-as-a-whole in its goal-seeking, (i.e., "culture"), it cannot do so effectively unless its feedbacks are influenced dynamically by the *whole* of experience. This concept of the curriculum as a feedback of the integrated whole is in precise contrast to that which seeks to inform and direct by means of an additive series of limited feedbacks as represented by specialized and un-integrated subjects. The obvious implication is that, amid our great need for more teachers, we actually have a greater need for specialists in generalization, or what Von Bertalanffy calls "scientific generalists" in the teaching profession.

More important even than these needs, however, are those required in our educational philosophy. Until now, under the influence of mechanistic-materialistic (therefore "entropic") philosophy, we have been subtly led to believe that education is a "levelling-off" process. There is an all-too-common if unexpressed belief that education obeys the law of entropy, by which energy at a high level (in the teacher) degrades to energy at a lower level (in the pupils). Since negative entropy is characteristic of living organisms, however, should not education consciously become that part of the open system of life which *increases* the capacity for decisions, for information?

The philosophical bases of educational methods still present are also founded on the mechanistic cause-effect concepts. Since equipotentiality prevails in open systems, it follows that education cannot fulfill its function maximally, so long as it disregards this fact.

¹ McClelland, Charles A., op. cit.

² Von Bertalanffy, L., op. cit.

Both of these statements are underscored by two brief quotations from a paper by John R. Platt³: (a) "Neural response is an amplification process, whereby the energy of the selected input signal is used to trigger a much larger release of output energy." and (b) "The Teynman theorem can be enlarged to touch other fields. In biology *response is amplification*. In the theory of knowledge, *knowledge is amplification*. These assertions provide new approaches for viewing the nature of biological and nervous response and the organization and scope of the brain." And, we dare to add, they mightily change the philosophy of education.

Elsewhere⁴ we have defined education as the process for the development of the basic resource of creativity from which human reality springs, implying thereby that education is not a *closed system*, but is functionally related to the open system which is all of life. Its function is that of directing life itself toward the goals which life seems impelled to seek. It cannot become the servomechanism for the maintenance of the *status quo*. It cannot be a levelling, standardizing, or stereotyping process. "Equal education for all," in the newer terms, becomes a process whereby equality of opportunity aims to produce the maximum of diversity of organization, and/or individual self-actualization and self-transcendence.

In the light of all of this, the place and function of education in human society is such that reappraisal of its economic and social support is urgent. Education is not ancillary to life. It is not an optional luxury. Therefore, methods of paying for education can no longer be afterthoughts in budgets. Only a total revision of our present status as regards educational budgeting and finance can support these new dimensions of the place and role of education in life. Dedicated teachers must, therefore, address themselves to a dual task: that of recasting education as life, and that of informing the makers of laws and the constructors of systems concerning the nature of this newly-conceived definition of education.

³ Platt, John R., "Amplification Aspects of Biological Response and Mental Activity." *American Scientist*, April 1956. See Source Reading in MAIN CURRENTS, Vol. 13, No. 2.

⁴ Culp, Harvey W., MAIN CURRENTS. Vol. 13, No. 3, p. 61.



A NOTE ON THE PERSONAL SIGNIFICANCE OF ABSTRACTIONS

Mildred Hardeman

New School for Social Research

IN the course of teaching a workshop for adults in ethics, I found myself faced with the problem of how to enable students to read and deal with abstract material in a meaningful way, of how to enable them to become as totally involved in reading abstract material as in daily problems of earning a living, taking care of a family, buying new clothes, etc.

The problem was especially acute since the students were not working for credit or for grades and hence did not form a captive audience where the problem could be glossed over by examinations and required assignments. Although some of the students gave no evidence of having read any material of an abstract nature in many years, all of them were eager for a meaningful educational experience. In addition, they had the courage to face their difficulties with surprising candor and to demand that their time not be wasted with abstractions that were meaningless to them in a personal way.

I had highly recommended the reading of Erich Fromm's *Man for Himself: an Inquiry into the Psychology of Ethics*. After two or three weeks I was distressed to find that many of the students found it an extremely difficult book and were discouraged by their failure to make sense of it. I wondered whether I had made a serious mistake in recommending the book.

I decided to select the following significant passages from the first part of the book and work on these in class with the students:

"... not only medicine, engineering, and painting are arts; *living itself is an art*—in fact, the most important and at the same time the most difficult and complex art to be practiced by man. Its object is not this or that specialized performance, but the performance of living, the process of developing into that which one is potentially. In the art of living, *man is both the artist and the object of his art*; he is the sculptor and the marble; the physician and the patient."

—Erich Fromm, *Man for Himself*, pp. 17-18.

"All organisms have an inherent tendency to preserve their existence; it is from this fact that psychologists have postulated an 'instinct' of self-preservation. The first 'duty' of an organism is to be alive.

"To be alive" is a dynamic, not a static, concept. *Existence and the unfolding of the specific powers of*

an organism are one and the same. All organisms have an inherent tendency to actualize their specific potentialities. *The aim of man's life*, therefore, is to be understood as *the unfolding of his powers according to the laws of his nature*.

"Man, however, does not exist 'in general.' While sharing the core of human qualities with all members of his species, he is always an individual, a unique entity, different from everybody else. He differs by his particular blending of character, temperament, talents, dispositions, just as he differs at his fingertips. He can affirm his human potentialities only by realizing his individuality. The duty to be alive is the same as the duty to become oneself, to develop into the individual one potentially is."

—Erich Fromm, *Man for Himself*, pp. 19-20.

I mimeographed these quotations, leaving a space between the lines. On passing out copies of this material, I asked the students to make the following changes: wherever they found the collective term "man," they should substitute the word "I," and for general terms such as "all organisms" the words "my organism" together with the appropriate changes in verb forms.

When this was done, a noticeable change occurred, in the brightness of their eyes, their facial expressions, and in body posture. The following comments emerged: "I didn't realize before that Fromm was talking about *me*." "Fromm makes *me* feel important." "It's so clear now." "Fromm is really beginning to make sense."

With these minor changes in the text, material that had formerly seemed remote and obscure now had immediate significance. The students now grasped at least one level of the author's meaning. They had a basis for understanding and reacting to the material they were reading.

After class I was bothered. Yes, I had found a device that rendered certain kinds of abstract material meaningful to the students in a personal way, but what of the validity of the change I had suggested? Certainly, the change did not exhaust the meaning of Fromm's passages, for he was making statements about *all* human beings, not simply about *one* human being. I then realized that in the whole procedure I was making use of a valid syllogism, omitting the minor premise.

At the next class meeting, I explained the logic behind our little device, and cautioned that it would

not be a valid procedure where the writer was talking about "some human beings" rather than "all human beings." My caution was unnecessary, for they had already discovered this point themselves.

I then passed out fresh copies of the same passages and asked the students to substitute "he" and "his," "she" and "her," letting these words stand for anyone they wished to consider. Then again with fresh copies I asked them to substitute "we" and "our" wherever it made sense to do so. One student pointed out that the substitution of "we" and "our" made the subject matter again as diffuse as it had been in the beginning. However, there was general agreement that these new substitutions provided considerable enrichment in the significance of the passages, although without the immediate emotional impact of the personal pronoun "I." Later in the semester a number of the students, including those who originally had great difficulty with the material, presented lively and intelligent evaluations of the various chapters of Fromm's book.

What is the significance of this project? The procedure amounts to a technique for rendering meaningful in a personal way abstract material that has

man as its subject matter. The very act of having to change words seems to stimulate the imagination so that the learner plays a more active role in the learning process. *He* becomes important in the learning situation—as important as the author—playing an active role rather than remaining a passive receptacle. The barrier that evidently has been erected between the learner and his books is broken down, and the learner has no choice but to react immediately and spontaneously either with feeling or thought, or both. It seems likely that people who are capable of reading in a meaningful way make this change from the abstract term to "I" and back again to the abstract without awareness of the process.

Perhaps we can conclude that if a personal relatedness to the material that is read is perceived and felt, understanding easily follows. If the personal relatedness in the form of an emotional impact is absent, I suspect that the cerebration, cut off from feeling, might as well be used on a cross-word puzzle. Many psychologists have pointed to the fact that real learning, the kind that "gets under the skin," is an activity of the total organism. Educators would do well to take it seriously.

SOURCE READINGS: INTEGRATIVE MATERIALS AND METHODS

The Effects of Ions on Us

AFTER eight years of research, it is clear that ionized atmospheres have demonstrable effects on human beings as well as animals. A full report of the experimentation (of which the following is an abstract) is given in "The Control of Air Ionization and Its Biological Effects," by W. Wesley Hicks and John C. Beckett, *Transactions* Paper No. 57-73 of the American Institute of Electrical Engineers, Committee on Electrical Techniques in Medicine and Biology, Winter General Meeting, New York, January 21-25, 1957.

Ions in the atmosphere have been a subject of investigation for many years. Acceptable proof that atmospheric ions have a biological effect has required numerous experiments, concerned primarily with the condition of ionization of air in living spaces.

The principal ionizing forces near the earth's surface are well-known. Of these, radioactive elements in the soil and cosmic rays are the most important. Ultraviolet radiation, X-ray, high voltage discharge, and thermionic sources influence room ionization, and therefore cannot be ignored. Space charge, created by the excess ions of one polarity over those of the other, is an environmental factor. This space charge is normally slightly positive and is attributed to the

lower mobility of light positive ions in relation to light negative ions.

Methods of producing and controlling ionization of the air have been reported. Of these, ionization from radioisotopes has been the most convenient. A new technique, making use of bacteriophage as a tracer substance, has also been found useful in studies of the behavior of submicroscopic charged particles.

Using radioactive ion generators for the production of unipolar ions, biological investigations were initiated on a broad front. Preliminary studies at the cellular level produced evidence that the biological effect of ions is a fundamental one. Statistically significant differences in rate of proliferation occurred: reproduction was accelerated under conditions of negative ionization, and retarded with positive ionization.

Experiments conducted at the University of California using micro-organisms showed that under some conditions a pronounced protective effect of ions could be demonstrated, and under others a lethal effect. Preliminary reports from Stanford University indicated an increase in the rate of growth of chickens under negative ionization. At the University of San Francisco, investigation of changes in cholesterol and ascorbic acid in the adrenals of rats exposed in positive and negative atmosphere showed changes in growth and in weight as compared to normal con-

trols. Studies to determine the effects of negatively ionized air on the blood pressure of female rats, conducted at the University of British Columbia, showed that pressures which had been artificially raised returned to normal and slightly below normal more rapidly when exposed to negatively ionized air.

Clinical studies designed primarily to observe effects on human respiration have been conducted, using radioisotopes for an air ion source. When twenty-seven patients with hayfever and asthma were exposed to the influence of negative ionization, two-thirds of them reported relief although they had no way of knowing that the air was ionized during the test. A continuation of these experiments on a larger group of patients showed similar effects.

Clinical tests have been conducted over a period of three years at the Good Samaritan Hospital in Los Angeles, to determine the extent of nasal obstruction after exposure to positive ions. Subjects exposed reported headaches, nasal obstruction, husky voice, dry throat or dizziness, in addition to a reduction of breathing capacity. The irritation appeared within two or three minutes after the start of ionization, and lasted as long as the ions were introduced into the respiratory tract.

—W. Wesley Hicks

Scientific Innovations

THE scientists' unceasing search into the properties of matter, and of materials, is sufficiently well recognized as to be considered a commonplace thing, in no way out of the ordinary. Not so well-known are some of the *usages* to which this ever-growing fund of information is being applied. For instance, the tiny *transistor*, a result of investigation into the properties of certain semi-conductors, such as germanium and silicon, has greatly reduced the size, weight, and power-requirements of "personal" radio receivers, electronic calculators, and a host of other electronic appliances. This too is well-known.

Not so well-known is the fact that a large silicon crystal, when ground into an optical lens, will *not* transmit ordinary light, but will transmit infra-red. Coupled to an infra-red detector, such a lens system provides a telescope which can "see" in the darkest night anything lighted by an invisible infra-red beam.

Solar energy research is providing new methods for the direct utilization of the energy of sunlight. Solar converter cells, smaller than postage stamps, are being produced to turn motors, operate relays, and perform a variety of similar tasks.

Petroleum research is responsible for a device which has been called "an electronic brain with a degree in geophysics." This machine turns out a picture of a vertical slice of earth three miles long and three miles down. It can do in minutes what a highly trained crew would take many hours to do — and what is more, it *remembers* what it has figured out!

Made for use in a gravity meter, a spring made of quartz, finer than a human hair and coiled to about an inch long, can be stretched to arm's length, and its elasticity is so perfect that it never develops fatigue, as metal springs do. This spring is so sensitive that, when incorporated in a gravity meter, there is no standard term to describe what it can measure. These developments are reported in *Business Week*, Dec. 22, 1956.

Permanent magnets made of a ceramic material, in which are embedded tiny granules of oxides of iron and barium, are finding a multitude of uses. These high-energy ceramic magnets may be used to replace the wire-wound field types in medium-size direct current motors. They may be expected to replace the more usual metal magnets in such fixed-gap applications as radio loudspeakers. In certain variable-gap circuits, their properties may even exceed those of the metallic Alnico V magnets, on a weight-for-weight basis, which makes this new material very attractive for holding devices, torque drives, and similar mechanical applications. Ceramic magnets have the advantages of lower weight, high electrical resistivity, great resistance to demagnetization; and they may be produced from inexpensive, non-critical raw materials. (See *Applied Magnetism*, pub. by The Indiana Steel Products Co., Valparaiso, Indiana).

The Magnetor, an educational device which demonstrates the relationship between magnetic and gravitational fields, utilizes three toroidal ceramic magnets. Their high energy product, combined with their lightness of weight, makes them eminently suitable for use in this device.

—Alan Mannion

Double Consciousness

THE possibility that memories stored in the brain may produce a double consciousness was advanced in the Proceedings of the American Philosophical Society, Vol. 98, No. 5, by Dr. Wilder Penfield, director of the Montreal Neurological Institute, who has long been studying the functions of the brain (see *MAIN CURRENTS*, Vol. 11, No. 2.)

Dr. Penfield indicates that under certain circumstances a person may be possessed of two consciousnesses, one of surroundings and circumstances which are immediate, and the other of those which are subconsciously retained. One state of awareness may be just as vivid as the other, and they are not likely to be confused.

This phenomenon of double consciousness occurs unpredictably, according to Dr. Penfield, when the cerebral cortex is stimulated by a mild electrical current. To explain its occurrence, it is suggested that every sensory experience is carried by the appropriate nerves to a specific part of the cerebral cortex, where it is coordinated with other impressions to form the total pattern of experience. The cells of the cortex might be thought of as a sound motion picture or tape

recorder, which retains the pattern of experience forever, even though parts of it may pass from conscious memory.

Dr. Penfield does not believe that the cerebral cortex, which is supposedly the seat of intelligence in man and the higher animals, is primarily responsible for the existence of consciousness. Before there is awareness, the patterns in the cortex must be relayed

to the "old brain," or brain stem. The electrical stimulation of the temporal cortex in some way reactivates one of the experience patterns which have passed from memory, and the nerve pathways leading to the "old brain" act as a mirror reflection of the former experience, resulting in the phenomenon of double consciousness.

—E. B. Sellon

NEWS AND NOTES

PROFESSOR Guardini's profound and simple prescription for the cure of the modern sickness was, let us remark, originally addressed to the German steel and iron institute. If the reader will bear this in mind, and give "Man the Incomplete" particularly quiet attention at some peaceful hour of his day he will, we believe, be himself actually stirred with deep hope and still joy. It is of great interest that his recommendations to the individual in search of personal integration are so sympathetic to those which Erich Fromm expresses in his new book, *The Art of Loving*, reviewed in this issue. All of us may pause at the thought that if the makers of steel and iron in Germany invoke such guidance, we may presently look for comparable seeking among the engineers and executives of U. S., Bethlehem and Republic Steel, of Kaiser and of American Aluminum, of the Anaconda and Kennecott Copper Companies. Indeed, we owe the translation of this extraordinary article to the insight and kind effort of Mr. Gilbert Doan, Manager of Metallurgical Research of the Koppers Company, Pittsburgh.

THE original little study in this issue, by Miss Mildred Hardeman, is more significant than its brevity might imply. She reports a test that revealed that many competent and mature students were almost incapable of reading themselves individually into an impersonal context. Here is a grave reflection on our philosophy of education; that despite our supposed scientific habits, the rule of principle and law *within* each human being is so uncertain and shadowy that a writer as cogent and searching as Eric Fromm should be read as if what he says applies only to others, not to one's self.

IT is a little dismaying to report, at this time, a news item from the bulletin of the Government of India Information Service (Washington, D. C., February 14, 1957). Advisers to the Ministry of Education have been collaborating with eleven leading universities there in a plan to introduce courses in gen-

eral education, blocked out along present American lines. We can only suppose that the Ministry is unaware that the real origins of general education were in a widely-acknowledged defeat in higher education in the United States in the nineteen forties. That we in this country should have struggled to find the real cure for over-specialization was to our credit, no doubt. That the universities and the funding Foundations failed to articulate a corrective was understandable, if lamentable. But that a decade or two later the people of India should hope to make over our defeat as their panacea is hard to believe.

May we say, most respectfully, that if the Government of India is resolute to succeed politically and economically in its independent policy of peace, it can certainly not expect to forward this hope by abandoning in higher education its own inimitable and irreplaceable cultural heritage? What is coming over the land that created in its realism (Nyaya-Vaisheshika) the doctrine of an harmonious plenum (Akasha) ages before the modern quantized field was established, that founded and long pursued the most remarkable form of higher experimental psychology and insight (the Sankhya-Yoga), that went on to the two Mimamsas (the greater and lesser exegeses), and finally crowned all this with the most penetrating, uncompromising and realistic monism, the Vedanta?

We of the West may perhaps, for special reasons, be confused. Our cultural heritage is a melange and many of its highest moments of group insight have been impaired and their fabric destroyed: the teachings of the Essenes, of the Gnostics, the neo-Platonists, and others. Shattered shards constitute too often a kind of debris, picked over in our general education courses. Witness the popularity of Plato's *Republic*, and the general disregard of (say) the *Symposium*, in most colleges. Imitation may have its place in life. Children certainly must at first learn by such means. But Professor Guardini is surely right in saying that India is, culturally speaking, charged with age and wisdom. If we of the United States are to be followed, may we not suggest to the Ministry of Education at New Delhi that it be in our successes, not in our expedients, our compromises, and our failures?

—F. L. K.

REVIEWS

Philosophical Depths Through Biological Insight

UNDER the title, *Matter, Mind and Man*, (World Perspectives, Vol. II, Harpers, N. Y., 1957, \$3.50) Edmund W. Sinnott has compacted a life-time of experience, research and reflection into a single readable and penetrating volume, bold, intellectually uncompromising, and philosophically competent in respect to well-established facts in biology, however demanding their theoretical treatment may be. Like many of us, Dean Sinnott has lived through the transition from mechanistic theory to field theory. He had the advantage of being a biologist. He has among other things been Sterling Professor of Botany at Yale. Protoplasm, development, growth, metamorphosis, morphogenetics and the like are far more significantly the denial of mechanism—on their very face—than anything found (until fairly recently) in electromagnetism or thermodynamics, where the non-material aspect is far below the surface.

In his little classic, *Cell and Psyche*, he shared with his readers the insight he has gained by honestly confronting, not ignoring or explaining away, the wondrous display we call life. In his later book, *The Biology of the Spirit*, he carried his thought further. Now he marshals all his resources to write of life, organism, body, mind, self, creativeness, freedom, spirit, beauty, right, ethics, life and death: not principally as a spectator, but as a participant; not as one resisting the logical consequences of that which he knows, but boldly moving on out of the physical world when the argument calls for that; not as a pedant, or a preacher, but genially and happily as one who has meaningfully related the facts from science and from experience, and who enjoys life himself.

In what other contemporary writer would we find a passage like this (p. 200-201), which is addressed to the problem of evil?

"They are like the 'acts of God' mentioned in an insurance policy, results of the chance and randomness of so many events. In this sense evil is inherent in the world. Chance necessarily opposes man's designs. In his long upward climb he has set his goals ever higher. As a builder lifts the topmost girder into place and then draws up the rest of the framework to it, tier by tier, the force he must continually fight against is the downward pull of gravity which ever threatens to destroy his work. In the construction of its edifice life sets up goal after higher goal, reaching at last toward the aspirations of man's spirit. The force continually opposing this upward climb is the universal tendency toward randomness, disintegration and therefore goallessness. Anything that happens by chance is almost certain to lead to disorder and thus to frustration of our desires. The devil is a long outmoded concept which may have more substance to it than we usually are willing to admit. Perhaps it should be revived and the devil looked upon as the personification of the second law of thermodynamics!" And when he comes to the point where he has no answer, the writer is as blunt with the reader as he has been honest with himself and his facts. Speaking of

the familiar and hopelessly inadequate kind of arguments about the meaning of the individual's life—in the good done for posterity, for example — he remarks (p. 209):

"But this secondhand sort of immortality, in offspring and in influence, is not what man sought at the dawn of things or seeks most today. There is a feeling of emptiness, of frustration, that comes over one when he thinks that after a long life of creative labor and love and growing knowledge he may come to naught at last, blank emptiness, wiped out and gone. Says Whitman, 'To think that the rivers will flow, and the snow fall, and fruits ripen, and act upon others as upon us now—yet not act upon us! . . . If maggots and rats ended us, then Alarum! for we are betrayed! . . . Do you think I could walk pleasantly and well-suited toward annihilation?'¹ There is something deep within that rebels at a fate like this, that says it is out of harmony with things. 'Our Creator,' Hawthorne remarks, 'would never have made such lovely days, and have given us the deep hearts to enjoy them, above and beyond all thought, unless we were meant to be immortal.'²"

And here must perforce end—in a conviction—Dean Sinnott's skilled, yet simple and moving, *personal* marshaling of all that physics, and biology, and psychology have supplied to him, in a long life of study, kindness, and high competence. He would, we believe, be the first to say that if mankind is to make more of all the wealth of data and principles it now commands, the task calls for *group* endeavor, in an institute devoted solely to those integrative formulations, for lack of which education and public policy are starved.

—F. L. Kunz

¹Walt Whitman, "To Think of Time."

²Nathaniel Hawthorne, *Mosses from an Old Manse*.

Science and the Magnitude of Man

ONE of the most striking characteristics of the advance of science is the bold imagination with which scientists have constructed large, open-ended, multi-dimensional conceptions of the universe. In those branches of science that deal with man, however, there is all too seldom to be found a comparable imaginativeness and largeness of thought. Academic psychology has supplied us with interesting data on the nature of perception and learning, and it has documented in detail the varieties of pathology in the human mind. But it has brought us essentially a small vision of man, limited in scope and narrow in its vistas.

In contrast, the conceptions of modern physics have an inspiring vitality because they represent a disciplined effort by modern man to comprehend the infinity of the universe. Modern psychology could have a similar vitality if it would address itself to the question of how the human being participates in and expresses aspects of the universe.

There have been some significant steps taken in this direction during the past two generations—especially in the field of study that is called, for want of a better name, Depth Psychology; but the main contributors, such as Sigmund Freud and C. G. Jung, have been so much in conflict with one another that they have confused the public to a considerable degree and have obscured the larger implications of their work.

In *The Death and Rebirth of Psychology* (Julian Press, N. Y., 275 pp., \$4.00), however, Ira Progoff traces the continuous development and deepening of insights in the work of Sigmund Freud, Alfred Adler, C. G. Jung, and Otto Rank, in order to show how these have led to a knowledge of man that reaches far beyond the original Freudian horizons. From the material that Dr. Progoff describes, it becomes quite clear, not as a matter of opinion but as an objective historical fact, that a fundamental transformation in point of view has taken place in the development of thought of the major depth psychologists.

"The death and rebirth of psychology that is the theme of this book," Progoff writes, "refers to the emergence of a new view of man that is fundamentally different from the conception with which psychoanalysis began. The contributions to this new view have come gradually, appearing bit by bit in the mature, reconsidered writings of the four men whose lifeworks have formed the pillars of modern depth psychology. We will not, however, find the new outlook stated explicitly in the writings of any one of them; but when we study the works of all together as part of the growth of depth psychology as a whole, a pattern of development and eventually of transformation reveals itself. Their individual writings and the various periods in their lifework then fall into place as integral phases of a cumulative unfoldment of knowledge in which the final result is radically different, virtually a new creation, when compared to the original starting point. The new view of man thus comes forth as an *emergent* of depth psychology in much the same way as a new species emerges out of the flux of nature."

Discussing this theme and Ira Progoff's development of it, Ashley Montagu recently wrote in the *Saturday Review*, "Out of Dr. Progoff's synthesis there emerges a new conception of the nature of man and of the purposes of depth psychology in relation to it." As an historical work, Progoff's book has an epoch-marking significance, for it draws the boundaries of an era in psychology that is coming to a close. And in its larger aspects, the book may have an epoch-making effect, for its "new conception of man" of which Ashley Montagu speaks may well provide the foundation on which a significant science of depth psychology will be built as an integrated discipline.

One of the themes of Progoff's historical interpretation is that "*Freud's conception of the unconscious has led beyond itself*," first on a psychological level and on a level beyond psychology where the new psychology begins.

On the first level, Progoff contributes a rewarding interpretation of the personal relations between Freud and Jung. Freud's conception of the unconscious on the one hand involved personal experiences or wishes that could not be accepted by consciousness, the "unconscious repressed," and on the other hand referred to a deep, archaic, impersonal layer of the personality whose activity was beyond the control of the individual's

conscious desires. Under the pressure of practical work, the "unconscious repressed" became by far the dominant object of attention, but Freud always felt that it was the dynamic and archaic aspect of the unconscious that had the greatest significance for the future development of depth psychology.

In 1909, Otto Rank undertook to develop this aspect of the theory of the unconscious in *The Myth of the Birth of the Hero*. Three years later C. G. Jung published his *Psychology of the Unconscious*, in which he carried Freud's early hypotheses further into his provocative theory of the "Collective Unconscious." It was then that the controversy began in earnest, but in it Progoff finds "a progressive enlargement in the conception of the unconscious depths of the psyche."

The development continued in Freud's efforts to clarify the irrationality of the primal "Id" and Jung's later attempts to define the primary "psychoid" patterns of human behavior. Underlying these researches was Jung's conception of the "Self" as representing "the basic realities of human nature, the potentialities and the limits of man's life." "As a psychological term," Progoff says, "the Self represents the infinite depth and magnitude of the human personality; and at its furthest reaches it touches the deepest ground of Being where man experiences the 'boundlessness of the soul' as an evident fact. The Self is thus a psychological term that is more than psychological by its very nature, for its function is to direct the modern mind by means of consciousness to levels of experience that transcend the ordinary range of intellectual understanding."

From a somewhat different direction, Alfred Adler came to conclusions that had much in common with Jung's. Adler seems never to have accepted Freud's fundamental conception of the unconscious, but he did work with "a conception of the human organism as a functional biological unit," and "in his later years progressed toward the view of Jan Christian Smuts that personality is the creative spiritual principle in the wholeness of man, the living seed of potentiality in human nature."

"Both Jung and Adler," Progoff says, "went to the borders of psychology and looked beyond. It remained, however, for Otto Rank to demonstrate that this was much more than a personal belief of theirs but an unavoidable outcome of psychoanalysis."

The significance of Rank's work was to demonstrate that modern psychology arose out of an effort to heal on a medical level the psychological afflictions that resulted from the break-down in traditional beliefs. In its origins, Rank pointed out, psychology had not been an objective science but an "ideology." Its hidden purpose was to provide a framework for rational thinking about the nature of human life to fill the vacuum left by the collapse of traditional ideologies in the nineteenth century. Rank further concluded that the concepts and techniques modern psychology requires are such that will lead the individual in a dynamic way to experiences that are beyond psychology, that is, as an intellectual ideology in modern times.

"After Rank," Ira Progoff writes, "psychology enters a new period." Its characteristic is its new orientation. "If psychology is to fulfill the purpose inherent in its historical existence, if it is to enable modern man to find the meaning of his life, it can do so only by guiding him to an experience that is beyond psychology. This conclusion culminates the analytical phase of depth psy-

chology, and provides the starting point for its growth in new directions."

The underlying significance of Progoff's book is that it offers "a conception of man as an organism of psychological depth and of spiritual magnitude," which provides the basis for a new depth psychology as an integrated science.

"Ours is an age," Dr. Progoff writes, "in which science, transforming itself in many areas from physics to psychology, is opening new spiritual vistas and extending the range of modern experience." Our present generation requires a psychological approach to the new view of the universe emerging from modern physics. This is an essential part of the search for a faith beyond dogma, if that faith is to become a lived reality. There is therefore the greatest significance in Dr. Progoff's conclusion that, "Of all the programs offered in our time, the new depth psychology holds the greatest promise of leading the modern man along the road of science to an experience of the meaning and the spiritual authenticity of his inner life."

—Martha Jaeger

Love: Art or Accident?

IS love an art? Then it requires knowledge and effort. Or is love a pleasant sensation, which to experience is a matter of chance, something one 'falls into' if one is lucky? This little book is based on the former premise, while undoubtedly the majority of people today believe in the latter." In this manner begins Erich Fromm's new book, *The Art of Loving* (Harper & Brothers, N. Y., 1956, 133 pp., \$2.75).

The author's viewpoint is stated forthrightly: "The mastery of an art must be a matter of ultimate concern; there must be nothing more important. This holds true for music, for medicine—and for love. And perhaps here lies the answer to the question of why people in our culture try so rarely to learn this art, in spite of their obvious failures: in spite of the deepseated craving for love, almost everything else is considered to be more important than love: success, prestige, money, power—almost all our energy is used for the learning of how to achieve these aims, and almost none to learn the art of loving."

In his chapter on "The Theory of Love," Dr. Fromm describes love as the active concern for the life and growth of that which we love, for the person *as he is*, not as we want him to be, for his growth and unfoldment for his own sake, without exploitation on our part.

The different types of love relationships in human life are brotherly love, motherly love, fatherly love, erotic love, self-love, and love of God. Of these, brotherly love is the most fundamental, and may be described as the sense of "responsibility, care, respect, knowledge of any other human being, the wish to further his life. It is love for all human beings; it is characterized by its very lack of exclusiveness. It is based on the experience that we are all one."

Motherly love is characterized by its unconditional nature, whereas fatherly love, on the other hand, is conditional, and its principle is "I love you because you fulfill my expectation, because you do your duty, be-

cause you are like me, because you obey me." It may be seen that most religions are based on this concept of fatherly love.

Erotic love is the most deceptive. In it, there can be the sudden experience of "falling" in love, in which barriers between two people collapse and an intimate closeness is experienced. "The other person becomes as well known as oneself (or as little known). If there were more depth in the experience of the other person, if one could experience the infiniteness of his personality, the other person would never be so familiar—and the miracle of overcoming the barriers might occur every day anew. But for most people their own person, as well as others, is soon exhausted. . . . If the desire for physical union is not stimulated by love, if erotic love is not also brotherly love, it never leads to union in more than an orgiastic, transitory sense." Throughout the book, it is emphasized that love is based on the desire for fusion, for loss of separateness, for becoming one with the other person. "This desire for interpersonal fusion is the most powerful striving in man."

Dr. Fromm's concept of "self-love" is difficult to convey, since so many people equate self-love with selfishness, believing it is virtuous to love others, but sinful to love oneself. Dr. Fromm's position is that selfishness and self-love are quite opposite. Since it is a virtue to love human beings, and since I am human, this rule must also apply to myself.

In considering the love of God, the author deals with the desire for fusion in connection with God, and also introduces the concept of "paradoxical logic" in contrast to Aristotelian logic. "Paradoxical logic was predominant in Chinese and Indian thinking, in the philosophy of Heraclitus, and then again, under the name of dialectics, it became the philosophy of Hegel. . . . The teachers of paradoxical logic say that man can perceive reality only in contradictions, and can never perceive in *thought* the ultimate reality—unity, the One itself. This led to the consequence that one did not seek as the ultimate aim to find the answer in *thought*. The only way in which the world can be grasped ultimately lies, not in thought, but in the act, in the experience of oneness. Thus paradoxical logic leads to the conclusion that the love of God is neither the knowledge of God in thought, nor the thought of one's love of God, but the act of experiencing the oneness of God."

This attitude led to the emphasis on right living, rather than right thought or right belief. This led to the tolerance of the Indian and Chinese religious developments, in contrast with Western religions, which emphasized "believing in God," and developed dogmas, intolerance, and endless arguments about formulations.

Dr. Fromm discusses the evolution of the concept of God through the history of the human race as being first similar to motherly love, later as fatherly love, and he predicts that the next stage in evolution is one in which "God ceases to be an outside power, but where man has incorporated the principles of love and justice into himself, where he has become one with God."

"It has been stated that the basis of our need to love lies in the experience of separateness and the resulting need to overcome the anxiety of separateness by the experience of union. The religious form of love, that which is called the love of God, is psychologically speaking, not different. It springs from the need to overcome separateness and to achieve union."

In the final chapter, which deals with the practice

of love, the general requirements are regarded to be the same as for any art, and include "discipline," concentration, patience, humility, rational faith, productiveness, and supreme concern for learning the art. In regard to concentration, the most important step is to learn to be alone with oneself, and this ability is a condition for the ability to love. A few simple exercises are suggested: "To sit in a relaxed position, to close one's eyes, and to try to see a white screen in front of one's eyes, and to try to remove all interfering pictures and thoughts, then to try to follow one's breathing; not to think about it, nor force it, but to follow it—and in doing so to sense it; furthermore to try to have a sense of 'I'; I—myself, as the center of my powers, as the creator of my world. One should, at least, do such a concentration exercise every morning for twenty minutes and every evening before going to bed."

The book concludes with the following words: "To analyze the nature of love is to discover its general absence today and to criticize the social conditions which are responsible for this absence. To have faith in the possibility of love as a social and not only exceptional individual phenomenon, is a rational faith based on insight into the very nature of man."

—W. M. Nicholson

The Many Facets of Modern Man

A searching analysis of our changing concepts of the nature of man and society is presented in *Frontiers of Knowledge in the Study of Man*, edited by Lynn White, Jr. (Harper and Brothers, New York, 1956, 330 pp., index, \$4.50). Authorities from seventeen fields have participated in the development of an amazingly consistent picture of modern man. One is led to believe that we are approaching a useful understanding of human nature when ideas developed in such fields as genetics and geography, with their vastly different methods of inquiry, reveal such compatible views of man.

The book has an interesting, readable style that is consistent throughout, which is remarkable since it is the relatively independent work of seventeen different authors. It is so well organized that the transition from one area to the next is less apparent than the broader subjects of concern. The book seems to emphasize five major aspects of human nature: man's biological, psychological, and social characteristics; the societies of man, his institutions, etc.; the cultured man with his enrichments; two skills with which man is advancing in rationality; man's search for deeper meanings; and the essence of all the preceding sections.

Let us consider each unit in more detail. The field of genetics is analyzed by Theodosius Dobzhansky, psychology by Gardner Murphy, cultural anthropology by Clyde Kluckhohn, and archaeology by Gordon R. Willey. Man has transcended all other animals in that he is capable of abstract thought. His cultural and biological diversity could be valuable in cooperation for the common good. Acceptance of our irrational, impulsive natures as of descent from animal ancestry makes it possible to deal more realistically with people. Human beings over all the world have more in common than we had previously suspected. Finally, man shows himself to be tough, flexible, and determined.

In the group concerned with society, the field of history is analyzed by Lynn White, Jr., sociology by Everett C. Hughes, politics by Peter H. Odegard, geography by George H. T. Kimble, and economics by Kenneth E. Boulding. Here we learn that we must have the courage to examine even those aspects of human nature that fear exposure. We are learning to prize all originality, not merely the kinds that were valued by the upper classes of the past. We see that with political power goes the responsibility for its legitimate use. Man is the most important factor in determining geography; and as he learns to apply principles of conservation in his economy, he may be able to use resources for the general welfare.

Those fields that primarily enrich human experience include the history of science analyzed by I. Bernard Cohen, musicology by Manfred F. Bukofzer, art history by Alfred Neumeier, and literature by Howard Mumford Jones. A study of the creative activity of science helps us to understand social and cultural changes and provides a bridge between the sciences and the humanities. The study of music as a form of artistic communication is an important key to the understanding of man's inner life and emotions. A study of the history of art reinterprets man's creative self-realization and makes static art works a living part of today. Literary scholarship can contribute much to the richness and depth of human understanding.

The two skills are linguistics, discussed by John Lotz; and mathematics, by Anatol Rapoport. It is important that we develop languages with suitable symbols for expressing abstractions as well as concrete ideas if we are to grow personally and socially. Mathematics provides a symbolic language that is free from the distortions of emotion and, therefore, suited to the expression of knowledge.

Man's search for deeper significances is dealt with in philosophy by Susanne K. Langer and in religion by George Hedley. We see how our power of symbolic thinking is basic to our inner experiences. Imagination appears to have tremendous influence on us. And now that our actual life and theoretical thinking have gone beyond our ability to imagine, our old models are useless, and as a result, our world image has disintegrated. If we are to construct a morality for the new age, we must build new concepts with which to deal with life as we now know it. A study of comparative religions reveals many universals like the "Golden Rule." Man can use symbols to reflect the polarities of finite man and infinite God. However, symbolism constantly runs the risk of becoming idolatry—it is so easy to confuse the symbol with the reality.

In the concluding section, Dr. White describes our changing image of human beings. The old distinctions between oriental and occidental are giving way to world-mindedness; we no longer stress training of the mind through logic and language, since we see man as the maker of symbols; our view of the rational man has enlarged to include the unconscious aspects of intelligence; and finally, the old hierarchy of values that omitted so much of human experience is being replaced by a spectrum of values that is wiping out barriers between classes and redefining the nature of human beings.

Seldom do we find such a wealth of stimulating ideas within the covers of one book. We recommend it to specialist and layman alike.

—Ruth Lofgren